SECTION 4

Environmental Consequences

Section 4 describes the beneficial and adverse social, economic, and environmental effects of the proposed alternatives and the measures to mitigate adverse impacts. The No-Action Alternative has been carried forward as a basis of comparison to the build alternatives that are also carried forward. The impact summary table at the end of this section summarizes the build alternatives' quantifiable impacts.

The project has been divided into three sections for the purposes of both alternatives development and impact assessment. Those three areas are:

- South Section (from 23rd Avenue to 12th Avenue in Moline)
- Central Section (from 12th Avenue in Moline to Lincoln Road in Bettendorf)
- North Section (from Lincoln Road in Bettendorf to 53rd Street in Davenport)

As the proposed alternatives do not require additional right-of-way within the South and North sections, the impacts to these areas are minimal and are consistent among the alternatives. Though impacts to those areas will be discussed in this section, this section will focus primarily on the Central Section, where there is a distinction in the impacts caused by the differences between Alignments E and F and their associated interchange configurations and local roadway improvements.

Where applicable, a table is used to denote the impacts of the alternative alignments and their associated interchange options. The same is true for the local roadway improvements. As discussed in Section 2, *Alternatives*, each alignment can be combined with one of two interchange variations in Moline and Bettendorf to form a complete alternative in the Central Section. In comparing the impacts of the two alignments, the table will be helpful to the reader in determining:

- The least impactive interchange option in Moline and Bettendorf for each alignment by comparing Variations M1 and M2 and Variations B1 and B2.[1]
- The least impactive combination of interchanges for each alignment (e.g., M1 with B1 or M1 with B2).
- The least impactive alignment, by comparing the best combination from step 2.

In addition to analyzing direct (i.e., "footprint") impacts associated with the proposed build alternatives, indirect and cumulative impacts are also analyzed for the environmental resource categories according to the methods outlined in the USEPA's 11-step process. Definitions of indirect and cumulative impacts per the Code of Federal Regulations (CFR) are as follows:

[1] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Also under consideration for the U.S. 67 local roadway improvement associated with B2 is the provision of 3 lanes in each direction. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

- Indirect effects are indirect impacts caused by an action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR 1508.8(b)).
- Cumulative impacts are the impacts on the environment that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).

4.1 Land Use Planning and Related Impacts

4.1.1 Right-of-Way Requirements

It is from the downtown areas, where the proposed improvements are on new alignment, that additional right-of-way would be required. In these areas, an assessment was made of how much existing right-of-way would be reused versus how much additional right-of-way would be required. Also assessed was how much existing right-of-way could be available for redevelopment.

No-Action Alternative

No existing right-of-way will be required for the No-Action Alternative.

South Section

In the South Section of the project (south of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no additional right-of-way is required.

Central Section—Mainline/Interchange Improvements

The right-of-way impacts of the proposed mainline/interchanges are shown in Table 4-1, *Right-of-Way Requirements For Central Section*, and in Appendix B, *Aerial Photo Exhibit*s. As can be seen from the table, the right-of-way requirements in Moline range from 10.6 to 13.1 acres and in Bettendorf from 9.9 to 10.3 acres. The right-of-way requirements of the alternatives range from 20.5 acres for Alignment E with Interchange Variations M1 and B2, to 23.4 acres for Alignment F with Interchange Variations M2 and B1. As Alignment F is located furthest from the existing facility, it generally has the greater right-of-way impacts. Among the interchange variations, M2 in Moline and B1 in Bettendorf generally have the greater impacts by the interchange type.

TABLE 4-1
Right-of-Way Requirements For Central Section (in acres)

	Moline		Bettendorf	
	Moline Interchange Variation 1 (M1)	Moline Interchange Variation 2 (M2)	Bettendorf Interchange Variation 1 (B1)	Bettendorf Interchange Variation 2 (B2)
Alignment E	10.6	13.1	10.1	9.9
Alignment F	11.0	13.1	10.3	9.9

Central Section—Local Roadway Improvements

Local roadway improvements are proposed for U.S. 67 and either Kimberly Road or Holmes Street. The right-of-way impacts associated with these improvement options are shown in Tables 4-2 and 4-3, *Right-of-Way Requirements for U.S. 67 Connections* and *Land Use Impacts Per Local Roadway Improvement*, respectively.

TABLE 4-2
Right-of-Way Requirements for U.S. 67 Connections (in acres)

	U.S. 67 90-Degree	U.S. 67 Diagonal
Interchange Variation B1	1.24	2.74
Interchange Variation B2*	0.72	2.29

Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

U.S. 67 Connections. The potential U.S. 67 connections may be combined with either interchange variation in Bettendorf. The right-of-way requirements range from 0.72 to 2.74 acres.

TABLE 4-3
Land Use Impacts Per Local Roadway Improvement

Local Roadway Improvement	Land Use Impact (Acres)
Holmes Street	0.07
Kimberly Road	0

Kimberly Road / Holmes Street. Improvements to Kimberly Road can be made with either Bettendorf interchange variation B1 (diamond interchange) or interchange variation B2 (partial cloverleaf [parclo] interchange) and would not require additional right-of-way.

Improvements to Holmes Street are only compatible with Bettendorf interchange variation B1 and are shown in Table 4-3, *Land Use Impacts Per Local Roadway Improvement*, and Appendix B, *Aerial Photo Exhibit*s.

North Section

In the North Section of the project (north of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no additional right-of-way is required.

4.1.2 Land Use Changes

As the proposed improvements would use existing right-of-way throughout much of the corridor, there would be limited direct conversion of land to transportation uses. The exception to this is in the downtown areas, where the proposed mainlines/interchanges and local roadway improvements would involve conversion of commercial, industrial, and residential lands to roadway use.

No-Action Alternative

The No-Action Alternative would not require any conversion of land to transportation uses.

South Section

In the South Section of the project (south of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no land use changes will result from proposed improvements.

Central Section—Mainline/Interchange Improvements

As mentioned above, land use changes will be localized to the downtown areas of Moline, Illinois, and Bettendorf, Iowa. The potential conversion of current land uses to transportation uses is shown in Table 4-4, *Land Use Changes Per Mainline/Interchange Improvement*. Primary land use types that will be transferred for transportation use are residential, commercial, and industrial. No agricultural lands will be converted to transportation uses.

TABLE 4-4
Land Use Changes Per Mainline/Interchange Improvement (acres)*

	Moline								Bettendorf							
	M1				M2				B1				B2			
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial	Total
Alignment E	0.6	2.7	6.6	**9.9**	0.6	5.8	6.2	**12.6**	0.6	8.3	0	**8.9**	0.2	8.2	0	**8.4**
Alignment F	0.6	3.9	6.2	**10.7**	0.6	5.8	6.2	**12.6**	0.6	8.4	0	**9.0**	0.2	8.2	0	**8.4**

* Does not include the conversion or use of public right-of-way currently owned by Moline or Bettendorf.

Central Section—Local Roadway Improvements

Local roadway improvements are proposed for U.S. 67 and either Kimberly Road or Holmes Street. These land use conversions do not include public right-of-way owned by either of the municipalities which may be incorporated into the alternative.

U.S. 67 Improvements. The land use changes of the U.S. 67 are discussed below.

- Improvements to the U.S. 67 with a connection off of a diamond interchange (B1) in a 90-degree configuration would result in 0.13 acres of residential and 1.01 acres of commercial lands being transferred to transportation uses.
- Improvements to the U.S. 67 with a connection off of a diamond interchange (B1) in a diagonal configuration would result in 0.18 acres of residential and 3.98 acres of commercial lands being transferred to transportation uses.

- Improvements to the U.S. 67 with a connection off of a parclo interchange (B2)[2] in a 90-degree configuration would result in 0.09 acres of residential and 0.57 acres of commercial lands being transferred to transportation uses.
- Improvements to the U.S. 67 with a connection off of a parclo interchange (B2)[3] in a diagonal configuration would result in 0.13 acres of residential and 3.42 acres of commercial lands being transferred to transportation uses.

Kimberly Road/Holmes Street Improvements. The land use changes of the Kimberly Road/Holmes Street Improvements are discussed below:

- Improvements to Kimberly Road can be made with either the diamond interchange (B1) or the parclo interchange (B2) and would not require additional land use changes.
- Improvements to Holmes Street are only compatible with the diamond interchanges (B1) and would result in 0.42 acres of residential lands being transferred to transportation uses.

North Section

In the North Section of the project (north of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no land use changes need to be made.

4.1.3 Transportation Impacts

No-Action Alternative

The No-Action Alternative is defined as no new major construction along the I-74 corridor. Improvements implemented with this alternative would be limited to short-term restoration activities (maintenance improvements) needed to ensure continued bridge and roadway pavement integrity. The design of the existing roadway, including its location, geometric features, and current capacity constraints, would remain unchanged. Under this alternative, some minor operational improvements could be anticipated, such as deployment of a traffic management system for the I-74 Mississippi River bridges, and minor improvements at high volume ramp intersections.

Under the No-Action Alternative, it is assumed that committed and planned improvements (as detailed in Iowa DOT and Illinois DOT multiyear improvement programs, and in the 2025 RTP) would still be undertaken. The No-Action Alternative assumes that planned or committed highway improvements (Baseline Improvements) identified in Table 4-5, *Baseline Improvements for No-Action Alternative*, would be undertaken.

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[2] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

[3] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

TABLE 4-5
Baseline Improvements for No-Action Alternative

Type	Project Location	Description
Highway	I-74 from 23rd Ave. in Moline to 53rd St. in Davenport	Maintenance improvements *
Highway	53rd St. from Elmore to Utica Ridge Rd. in Davenport	Widening to 6 lanes
Highway	Spruce Hills Rd. (U.S. 6) from I-74 to Utica Ridge Rd. in Bettendorf	Widening to 6 lanes
Highway	Centennial Bridge between Davenport and Rock Island	Removal of tolls
Highway	Bettendorf-East Moline Bridge between Bettendorf and East Moline	Construction of new four-lane river crossing

* 2025 RTP proposes widening of I-74 from IL-5 to 53rd Street.

Source: *2025 Quad City Area Long Range Transportation Plan*

The No-Action Alternative would not meet the project's purpose and need and would result in the following consequences:

- Safety needs would not be met. As discussed in Section 1, *Purpose of and Need for Action*, the existing facility experiences a high crash rate, particularly in the downtown areas where the approaches to the bridges have undesirable horizontal and vertical curves. The No-Action Alternative would not meet this need.
- Capacity and operational deficiencies would expand and worsen. Without improvements to capacity and operational issues, the congestion result in a breakdown in traffic flow during peak periods and increasingly unreliable travel times for people, good, and services.
- Travel reliability would not be improved. The No-Action Alternative would not meet the capacity and geometric needs that would allow for both better traffic flow during normal travel periods as well as improved traffic flow when emergency or maintenance activities occur on the bridges.
- Without improvement, the condition of the physical infrastructure would worsen, resulting in increased maintenance activities and costs. Increases in maintenance activities also have the related impact of additional impedance to the flow of traffic when maintenance is necessary on the bridges.

Build Alternatives—Roadway

Proposed improvements to the I-74 corridor have been developed to improve the safety and operations of the interstate and its access to the local road systems and other modes of transportation. Both alignments would improve the conditions along the mainline of I-74 by:

- Providing increased capacity for traffic.
- Improving the horizontal curves on the Illinois side of the Mississippi River bridges.

- Providing a wider cross section, which would allow room for disabled and emergency vehicles to be removed from the flow of traffic.

The interchange configurations designed for each alignment would also improve access to the local road system by providing additional storage capacity for vehicles exiting the interstate, allowing those vehicles to be removed from the mainline and reducing the potential for them to impede the flow of traffic along the mainline. The entrance and exit ramps would also be improved to eliminate the existing deficiencies in the vertical alignments of the ramps.

In downtown Moline and downtown Bettendorf, the interchange configurations were designed to provide more direct connections to major state routes (by changing ramp locations) and to improve ramp design characteristics. These proposed interchange configurations will provide improved direct access between I-74 and major state routes (IL 92 in Moline via ramp connections at 6th Avenue [IL 92 EB] and 4th Avenue [IL 92 WB]; and U.S. 67 in Bettendorf via ramp connections at Grant Street [U.S. 67 WB]). These direct connections will provide more efficient access for industrial, manufacturing, and residential land uses along the corridors.

The proposed interchange configurations in downtown Moline would result in only minor changes in traffic patterns on the local roadway system, stemming from the changes in ramp locations and from the proposed closure of 5th Avenue under I-74. This local roadway closure is necessary due to the fact that there is inadequate vertical clearance (or offset) between the proposed interchange ramps and the elevation of the local roadway.

In downtown Bettendorf, the proposed interchange configurations would result in more substantial changes in traffic patterns along the local roadway system. The changes result from the closures of two local roadways under I-74 (Brown Street and either Holmes Street/Mississippi Boulevard or Kimberly Road), from the conversion of a section of Grant Street (U.S. 67 WB) to a two-way street, and from the elimination of the existing ramps at Kimberly Road. As with the 5th Avenue closure noted above, the local roadway closures under I-74 are necessary since there is inadequate vertical clearance between the proposed interchange ramps and the elevation of the local roadways. While both interchange variations under consideration (Variation B1, a diamond type interchange, or Variation B2, a parclo type interchange) would result in localized changes in travel patterns, they would not result in significant out-of-direction travel. Access impacts to specific properties are show in Table 4-6, *Property Access Impacts*, located at the end of this section.

By providing additional capacity along the mainline, both alignments would also enable improved reliability of bus service through the project corridor. The additional capacity would allow smoother traffic flow with less congestion, thus reducing impacts to bus schedules caused by traffic congestion. Similarly, access to air and rail service could be improved by both alignments. With a smoother flow of traffic, freight being transferred between trucks and rail cars or airplanes would have an improved ability to meet scheduled transfers. Improved access to the regional airport for air passengers would also be created by better traffic flow.

Build Alternatives—Bicycle/Pedestrian

The proposed build alternatives include the potential for a new bicycle and pedestrian crossing of the Mississippi River. This would be accomplished by either providing a new path along a new bridge or by converting one of the existing I-74 Mississippi River bridges to carry bicycle and pedestrian traffic exclusively. A Mississippi River crossing for bicyclists and pedestrians

would provide a new connection between two significant trails along the river; the Great River Trail on the Illinois side, and the Bettendorf Riverfront Trail on the Iowa side. The provision of such a new connection would be consistent with the goals of the 2025 RTP, which recommends that bicycle/pedestrian crossings be accommodated with future Mississippi River bridge improvements as well as the eventual incorporation of the Great River Trail into the major trail network currently consisting of the Grand Illinois Trail, Mississippi River Trail, and American Discovery Trail. See Section 2, *Alternatives*, for additional information on the incorporation of bike/pedestrian accommodations into the proposed improvements.

4.1.4 Navigation Impacts

The No-Action alternative would not have an impact on navigation. The existing opening size and pier spacing has been determined to be acceptable by the U.S. Coast Guard.

The elevation of the existing bridges provides adequate clearance for vessel traffic. Per coordination with the U.S. Coast Guard, a bridge on new alignment will have at least the same vertical and horizontal clearance as the existing bridge. If future traffic is comparable to existing volume and size, no changes in the adequacy of the clearance provided by the bridge will occur. Construction operations would be designed for minimal passageway construction and closures.

The U.S. Coast Guard has been participating in this National Environmental Policy Act (NEPA) process as a cooperating agency for assistance with evaluation of impacts of the proposed bridge on navigation and the environment. The proposed bridge replacement will require a Section 9 permit from the U.S. Coast Guard. As part of the Section 9 permit, water quality certification must be obtained from Illinois EPA and the Iowa DNR. See Section 4.8, *Water Resource Permits*, for additional information on the Section 9 permit.

4.1.5 Utilities

No utilities would be impacted by the No-Action Alternative.

All of the build alternatives would require the relocation of existing public utility facilities that cross the I-74 corridor. The types of utility relocations that would be required would be typical of projects involving the construction of roadways on new alignments. Utility impacts could include fiber optic communications cable, underground and overhead electric lines, gas mains, telephone cable, and sanitary and storm sewers.

The largest public utility in the project corridor is the Moline Water Treatment Plant, which is located just west of the existing bridges. None of the build alternatives would impact this facility.

The Illinois and Iowa DOTs would coordinate with utility providers during the project's final design phase to ensure that there would be no interruption of service during construction. Utilities located within existing right-of-way would be relocated at the expense of the utility provider. Utilities currently located in proposed right-of-way would be relocated at the expense of the Illinois or Iowa DOT, as appropriate based on location.

4.1.6 Public Facilities and Services

No-Action Alternative

No public facilities and services would be impacted by the No-Action Alternative, as any improvements associated with this alternative would occur within the existing right-of-way.

South Section

In the South Section of the project (south of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no public facilities and services will be impacted by this section of the proposed project.

Central Section—Mainline/Interchange Improvements

Impacts to public facilities and services by the proposed mainline/interchanges are shown in Table 4-7, *Impacts to Public Facilities and Services Per Mainline/Interchange Improvement*.

TABLE 4-7
Impacts to Public Facilities and Services Per Mainline/Interchange Improvement

	Moline		Bettendorf	
	M1	**M2**	**B1**	**B2**
Alignment E	First Congregational Scottish Rite Cathedral	First Congregational Scottish Rite Cathedral	Our Lady of Lourdes Catholic School	Our Lady of Lourdes Catholic School
Alignment F	First Congregational Scottish Rite Cathedral	First Congregational Scottish Rite Cathedral	Our Lady of Lourdes Catholic School	Our Lady of Lourdes Catholic School

Impacts are to the parcel only. Structure would not be displaced.

Central Section—Local Roadway Improvements

Impacts to public facilities and services by the proposed local roadway improvements are discussed below.

U.S. 67 Improvements. U.S. 67 improvements associated with Interchange Variation B1 would impact the Apostolic Assembly of Bettendorf. The Apostolic Assembly would also be impacted if 3 lanes in each direction along Grant Street were included in U.S. 67 improvements associated with Interchange Variation B2.

Kimberly Road/Holmes Street Improvements. The Kimberly Road underpass variation would not impact existing public facilities or services. The Holmes Street underpass option would impact McManus Park. It is likely that a temporary easement would be required to construct a retaining wall. The retaining wall would be used to avoid a permanent acquisition of right-of-way.

North Section

In the North Section of the project (north of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no public facilities and services will be impacted by this section of the proposed project.

No educational facilities will be impacted by any of the build alternatives.

4.1.7 Consistency of the Proposed Action with Land Use Plans

Carefully planned roadway improvements can foster beneficial results, such as making the community more cohesive and serving future growth and planning policies. Lack of planning for roadway improvements can bring undesirable effects to a community, including fracturing community cohesion. Table 4-8, *Summary of Documents Reviewed for I-74 Improvements*, identifies the documents that were reviewed to determine how the existing transportation facility could be improved to support the goals identified by each of the Quad Cities communities and the community as a whole. These documents were used to develop both the purpose and need and alternatives, as they help to understand local conditions, goals, and perceptions about the existing transportation system and its needs. It also summarizes issues and policies relating to improvements to I-74 through the project area. Each proposed alternative would be consistent with plans and guidelines outlined in those documents.

By remaining close to the existing I-74 corridor, both alignments reduce the amount of right-of-way needed and the amount of land uses that would be converted to transportation uses.

TABLE 4-8
Summary of Documents Reviewed for I-74 Improvements

Document	Comment
Riverfront—Downtown Conceptual Plan "State Street Landing. City of Bettendorf. October 2000.	The plan identifies the Mississippi riverfront area, both east and west of I-74, as the location for a multifaceted gateway to Iowa. Details of the development continue to evolve; however, important elements to be incorporated include multiple uses, creation of a pedestrian friendly environment, and changes to the local roadway system.
Draft 2025 Quad Cities Area Long-Range Transportation Plan. Bi-State Regional Commission. Adopted March 2001, amended July 2002.	The plan discusses the importance of the I-74 bridge and the need for improvements. This document identifies several important strategies that were adopted by the task force appointed by the Transportation Policy Committee of the Bi-State Commission, including establishment of a project advisory group to promote and advise on the proposed improvements.
Comprehensive Economic Development Strategy for the Bi-State Region 2001. Bi-State Regional Commission. December 2001.	The "Highway Transportation" section of the document references the 1998 Mississippi River Crossing Study, which identified expanding capacity on the I-74 bridge as an important transportation need. Public support for this, and other transportation improvements, was determined through a random survey.
City of Bettendorf, Iowa Draft Comprehensive Plan. City of Bettendorf and Bi-State Regional Commission. December 2000.	The plan identifies Mississippi River crossings as one of the most important transportation issues in the Quad Cities and states that reconstruction and widening of the I-74 bridge is necessary. As part of improvements to I-74, the plan notes the importance of preserving as much of the riverfront as possible.

4.1.8 Indirect and Cumulative Impacts

As the project is located in a densely developed municipal area, with both commercial and residential development, there is little available land in the corridor on which secondary

development may occur. One exception is at the north terminus of the corridor, where conversion of agricultural land use to commercial and residential development has already been occurring and is part of the planning effort developed by Davenport. It is expected that this will continue to occur, regardless of the proposed changes to the roadway.

Improvements to the corridor could spur redevelopment of existing properties. Land use management at the local level can provide for orderly redevelopment at acceptable locations. Both Bettendorf and Moline have redevelopment plans in place to guide conversion of land use through the corridor. In addition, all of the proposed alternatives were coordinated with local officials to ensure that the interchange configurations and access points were consistent with future land use and redevelopment initiatives. The proposed roadway improvements would be consistent with each of the communities' plans (see the following section). Additionally, construction of any of the alternatives has the potential to create excess parcels once construction has been completed and traffic has been relocated to the new facility. These excess parcels may provide additional area for redevelopment, including the relocation of public facilities such as the Apostolic Assembly of Bettendorf. Were this church to be relocated within the same area, any indirect impacts to it or its congregation would be minimized.

4.2 Socioeconomic Impacts

4.2.1 Environmental Justice

On February 11, 1994, President Clinton issued Executive Order 12898 on Environmental Justice. The Order requires all federal agencies to address the effects of their programs with respect to environmental justice. It states that, to the extent practicable and permitted by law, neither minority nor low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires that representatives from low-income or minority populations that could be affected by the project be provided the opportunity to be included in the impact assessment and public involvement process.

An environmental justice analysis was completed to determine whether the proposed project had the potential to exert disparately high and/or adverse impacts upon minority or low-income populations and to assess if such impacts would be disproportionate in comparison to the total population ratio. If the high and adverse impacts are found to be borne disproportionately by low-income and minority populations, an analysis must examine mitigation measures, offsetting benefits, and impacts of other system elements in accordance with FHWA Order 6640.23, Actions to Address Environmental Justice in Minority Populations and Low-income Populations (U.S. DOT, FHWA 1998).

Minority and low-income population information for the project area was gathered from 2000 Census data. Block group data adjacent to or within 0.6 miles east or west of the proposed improvements from just south of 23rd Avenue in Moline to north of 53rd Street in Davenport were examined. This area includes all of the potential displacements as well as the residents most likely to be impacted by noise increases, construction impacts, or access and travel continuity issues. Detailed analysis follows.

The average percentage of the residents in the immediate project area that are minority is eight percent, as shown in Table 4-9, *Immediate Project Area Demographics*. African Americans,

those classifying themselves as two or more races or those who consider themselves some other race are the largest portions of the minority population. A sizeable percentage of the population also classifies themselves as Hispanic. The minority percentage of the immediate project area is less than the minority percentages within the Quad Cities as shown in Table 4-9, *Immediate Project Area Demographics*. The minority percentage of the census block groups only in Illinois is about 14 percent, whereas in Iowa the minority percentage is about 6 percent.

A block group analysis showed the 1999 median household income in the immediate project area to be more than $46,000, greater than the median household income within the Quad Cities MSA. The immediate project area's median household income exceeds the U.S. Department of Health and Human Services 2003 poverty guideline of $18,400 for an average family of four. Less than two percent of the population in the immediate project area is living in a census block group that has a median household income that falls below the poverty guideline.

Based on the discussion above, the proposed action does not have the potential to exert high and/or disproportionate adverse impacts upon minority or low-income populations. The proposed action would result in impacts throughout the project area. While some of those impacts may be borne by minority and low-income residents, the level of impact would not be disproportionately high, and therefore would not be considered specifically as an Environmental Justice Impact. Nonetheless, these impacts would be mitigated to the extent practicable and allowable by law, rule, and code.

The proposed project is in compliance with Executive Order 12898 and FHWA Order 6640.23. The project's public involvement process did not exclude any individuals due to income, race, color, religion, national origin, sex, age, or handicap. Meeting locations were specifically selected to accommodate bus dependent persons, and meetings with the pastor of a local Spanish church, the Apostolic Assembly of Bettendorf, were held to identify the best methods for reaching his congregants and other Hispanic residents.

Indirect and Cumulative Impacts

The majority of the impacts associated with the proposed improvements would be immediate effects ranging from potential noise increases to relocation. As the impacted areas are already located adjacent to an interstate, the indirect and cumulative impacts of the proposed action would be minimal. Access would be maintained or improved throughout the corridor. Access modifications could cause some change in travel patterns, however, no major indirect or cumulative effects would be disproportionately borne by low income and/or minority populations.

4.2.2 Residential Relocation Impacts

Residential displacements that occur due to the proposed alternatives vary between the river crossing alignments and interchange configurations. The greatest number of residential displacements is associated with the downtown Moline loop configuration (M2), displacing seven residential structures with both Alignments E and F. See the exhibits in Appendix B, *Aerial Photo Exhibits*, for the location of impacted structures.

TABLE 4-9
Immediate Project Area Demographics

	2000 Population	2000 Minority Population	2000 Population below 18*	2000 Population over 65*	2000 Average Household Size*	2000 Owner Occupancy Percentage*	1999 Median Household Income*
Overall Project Area	26,533	2206 (8.3 percent of population) **Black or African American** – 745 (33.8 percent) **American Indian & Alaska Native** – 116 (5.3 percent) **Asian** – 276 (12.5 percent) **Native Hawaiian & Other Pacific Islander** – 0 (0.0 percent) **Other race** – 765 (34.7 percent) **Two or more races** – 304 (13.8 percent) *Hispanic residents are imbedded within the other races, 1,756 residents identify themselves as Hispanic	6,590 (25.0 percent of population)	3,022 (11.5 percent of population)	2.4	75.3	$46,460
Project Area in Iowa	18,215	1,074 (5.9 percent of population) **Black or African American** – 487 (45.34 percent) **American Indian & Alaska Native** – 52 (4.8 percent) **Asian** – 269 (25.0 percent) **Native Hawaiian & Other Pacific Islander** – 0 (0.0 percent) **Other race** – 126 (11.73 percent) **Two or more races** – 140 (13.0 percent) *Hispanic residents are imbedded within the other races, 396 residents identify themselves as Hispanic	4,319 (23.9 percent of population)	2,278 (12.6 percent of population)	2.5	79.7	$52,579
Project Area in Illinois	8,318	1,132 (13.6 percent of population) **Black or African American** – 258 (22.8 percent) **American Indian & Alaska Native** – 64 (5.7 percent) **Asian** – 7 (0.6 percent) **Native Hawaiian & Other Pacific Islander** – 0 (0.0percent) **Other race** – 639 (56.4 percent) **Two or more races** – 164 (14.5 percent) *Hispanic residents are imbedded within the other races, 1,360 residents identify themselves as Hispanic	2,271 (27.5 percent of population)	744 (9.0 percent of population)	2.5	65.6	$40,441
Quad Cities	359,062	62,566 (17.4 percent of population) **Hispanic** – 20,712 (33.1 percent) **Black or African American** – 20,603 (32.9 percent) **American Indian & Alaska Native** – 1,390 (0.2 percent; **Asian** – 3,860 (0.6 percent) **Native Hawaiian & Other Pacific Islander** – 27 (0.0 percent) **Other race** – 9,081 (0.15 percent) **Two or more races** – 6,893 (0.11 percent)	90,239 (25.1 percent of population)	49,617 (13.8 percent of population)	2.5	71.3	$40,621

*Source: U.S. Census Bureau, 2000.

Most of the residences that would be displaced are owner-occupied. Approximately 75 percent of all housing units in the project area are owner-occupied. There is no shortage of replacement housing across various price ranges in the study area, as evidenced by Multiple Listing Service data. The homes that would be affected range in value from under $50,000 to almost $200,000. A search of homes for sale in the Quad Cities resulted in numerous available structures across all housing price ranges. In 2001, over 3,400 homes were sold in the Quad Cities market, and over 50 percent of those (1,779) were in the communities of Davenport, Bettendorf, and Moline (Ruhl & Ruhl Relocation Report 2002). Based on the average household size of 2.46 persons (derived from the 2000 Census data for Rock Island, Henry, and Scott counties), the range of residents that would be relocated from single-family and multiple-family residences is shown in Table 4-10, *Estimated Residential Displacements and Relocations Per Mainline/Interchange Improvement*.

TABLE 4-10
Estimated Residential Displacements and Relocations Per Mainline/Interchange Improvement

	Moline		Bettendorf	
	M1	**M2**	**B1**	**B2**
Alignment E				
Single family residential structures	1	6	4	4
Multi-family residential structures	1 (4 units)	1 (5 units)	0	0
Individuals to be relocated (# of structures * 2.46)	10	27	10	10
Alignment F				
Single-family residential structures	4	6	4	4
Multi-family residential structures	1 (4 units)	1 (4 units)	0	0
Individuals to be relocated (# of structures * 2.46)	20	25	10	10

No-Action Alternative

No residential displacements are associated with the No-Action Alternative.

South Section

In the South Section of the project (south of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no relocations would be required.

Central Section—Mainline/Interchange Improvements

The Central Section extends from downtown Moline across the river through downtown Bettendorf. The highest number of residential displacements would occur in downtown Moline with Interchange Variation M2. Alignment F with M1 would result in five displacements (four single-family structures and one multi-family structure with four units), whereas Alignment E would result in two residential displacements (one single-family

structure and one multi-family structure with four units). Interchange variation M1 would result in fewer residential displacements for both Alignments E and F with two residential displacements (one single-family structure and one multi-family structure with four units) and five residential displacements (four single-family structures and one multi-family structure with four units) respectively. The multi-family structure is the former Knights of Pythias Lodge Hall, which has been converted to apartments.

In downtown Bettendorf, residential displacements are nearly identical across alignments and interchange configurations. Alignment F with either interchange variation B1 or B2 would result in four residential displacements, as would Alignment E with B1 or B2. Displacements associated with each mainline/interchange alternative are shown in Table 4-10, *Estimated Residential Displacements and Relocations Per Mainline/Interchange Improvement*.

Central Section—Local Roadway Improvements

Local roadway improvements are proposed for U.S. 67 and either Kimberly Road or Holmes Street (Table 4-11, *Estimated Residential Displacements and Relocations Per U.S. 67 Variation*). Interchange Variation B2 with either of the U.S. 67 improvement options will have fewer impacts than either option combined with Interchange Variation B1.

TABLE 4-11
Estimated Residential Displacements and Relocations Per U.S. 67 Variation

	Interchange Variation B1		Interchange Variation B2*	
	90-Degree	**Diagonal**	**90-Degree**	**Diagonal**
Single-family residential structures	4	5	0	3
Multi-family residential structures	0	2 (2 and 8 units)	0	2 (2 and 8 units)
Individuals to be relocated (# of structures × 2.46)	10	37	0	32

* Impacts shown reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

U.S. 67 Improvements. The impacts of the U.S. 67 improvements are discussed below.

- Improvements to U.S. 67 with Variation B1 in a 90-degree configuration would displace four single-family residences, resulting in 10 residents impacted.
- Improvements to U.S. 67 with Variation B1 in a diagonal configuration would displace five single-family residences and two multi-family buildings (two and eight units each), resulting in 37 residents impacted.
- Improvements to U.S. 67 with Variation B2[4] in a 90-degree configuration would not displace any residences.

[4] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

- Improvements to U.S. 67 with Variation B2[5] in a diagonal configuration would displace three single-family residences and two multi-family buildings (two units and eight units each), resulting in 32 residents impacted.

Kimberly Road/Holmes Street Improvements. The impact of the Kimberly/Holmes options are discussed below.

- Improvements to Kimberly Road can be made with either interchange Variation B1 or Variation B2 and would not result in any residents being impacted.
- Improvements to Holmes Street are only compatible with interchange Variation B1 and would displace one single-family residence, resulting in three residents impacted.

North Section

In the North Section of the project (north of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no relocations would be required.

Both Iowa and Illinois DOTs will provide relocation assistance and payments to all individuals, families, businesses, and nonprofit organizations without discrimination that are partially or totally displaced by the project. Both states' relocation programs are in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 USC 4601) and in Illinois, the Illinois DOT *Land Acquisition Procedures Manual* as well. Additionally, low-income families would be eligible for housing of last resort.

Indirect and Cumulative Impacts

Relocation impacts, by nature, are experienced immediately. The conversion of residential properties to transportation use would cause some change in the nature of the area, but as all of the residential relocations are downtown, the affected areas already exhibit mixed land uses, with most of the land devoted to various business purposes. Over time, some portions of the land may become available for redevelopment, and the redevelopment could likely be an alternative use that is deemed more compatible with the adjacent interstate. However, any future development of the land along the interstate falls under local jurisdiction and could be managed and controlled by land use planning and zoning regulations.

4.2.3 Business Relocation Impacts

The business displacements that would occur due to the proposed alternatives are concentrated in the downtown areas, and along the U.S. 67 corridor. See the exhibits in Appendix B, *Aerial Photo Exhibits*, for the location of impacted structures.

No-Action Alternative

The No-Action Alternative would not have any business relocation impacts, as any activities, such as routine maintenance, associated with this alternative would be within the existing right-of-way.

[5] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

South Section

In the South Section of the project (south of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no relocations would be required.

Central Section—Mainline/Interchange Improvements

In downtown Moline, impacts vary based on the interchange configuration. Alignments E and F coupled with the split diamond interchange configuration (M1) would result in the displacement of four and three businesses respectively; however, Alignment E would impact approximately 535 employees, whereas Alignment F affects approximately 65 employees. Alignment E with the loop interchange configuration (M2) would result in the displacement of seven businesses with at total of 575 employees; Alignment F with the loop interchange (M2) would result in the displacement of six businesses with a total of approximately 75 employees.

In downtown Bettendorf, Alignment E with either the parclo (B2) or diamond (B1) interchange configuration would result in equal business impacts, 12 businesses with a total of 73 employees. Alignment F with the parclo interchange configuration (B2) and Alignment F with the diamond interchange configuration (B1) would also result in equal displacements, 11 businesses with a total of 68 employees. Both Alignment F interchange configurations have slightly lower impacts with 11 businesses impacted affecting approximately 68 employees. The displacements in the Central Section are shown in Table 4-12, *Commercial Building Displacements Per Mainline/Interchange Improvement.*

TABLE 4-12
Commercial* Building Displacements Per Mainline/Interchange Improvement

	Moline			Bettendorf	
	M1 # Displacements (# Employees)	M2 # Displacements (# Employees)	Bridge	B1 # Displacements (# Employees)	B2 # Displacements (# Employees)
Alignment E	4 (535)	7 (575)	—	12 (73)	12 (73)
Alignment F	3 (65)	6 (75)	—	11 (68)	11 (68)

* Includes retail, office, and industrial buildings.
Employee numbers are based on a combination of field observations, individual business contacts, and Institute of Transportation Engineers (ITE) trip generation estimates.

Central Section—Local Roadway Improvements

Local roadway improvements are proposed for U.S. 67 and either Kimberly Road or Holmes Street. The commercial displacements associated with these improvement options are discussed below (Table 4-13, *Commercial Building Displacements Per U.S. 67 Improvement*).

TABLE 4-13
Commercial[a] Building Displacements Per U.S. 67 Improvement

	90-Degree # Displacements (# Employees)[b]	Diagonal # Displacements (# Employees)
Interchange Variation B1	7 (34)	19 (120)
Interchange Variation B2[c]	1 (15)	16 (108)

[a] Includes retail, office, and industrial buildings.

[b] Employee numbers are based on a combination of field observations, individual business contacts, and ITE trip generation estimates.

[c] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

U.S. 67 Improvements.

- Improvements to U.S. 67 with a connection from a diamond interchange (B1) in a 90-degree configuration would displace seven commercial buildings. Roughly 34 employees are associated with the displaced businesses.
- Improvements to U.S. 67 with a connection from a diamond interchange (B1) in a diagonal configuration would displace ten commercial buildings (three of which are multi-tenant buildings). The multi-tenant buildings house a variety of service industries such as hair styling, chiropractic services, massage, and financial planning. Roughly 120 employees are associated with the displaced businesses.
- Improvements to the U.S. 67 with a connection from a parclo interchange (B2)[6] in a 90-degree configuration would displace one commercial building. Roughly 15 employees are associated with the displaced tavern/restaurant.
- Improvements to the U.S. 67 with a connection from a parclo interchange (B2)[7] in a diagonal configuration would displace six commercial buildings (three of which are multi-tenant buildings). The multi-tenant buildings house a variety of service industries such as hair styling, chiropractic services, massage, and financial planning. Roughly 108 employees are associated with the displaced businesses, based on business type.

Kimberly Road/Holmes Street Improvements.

- Improvements to Kimberly Road can be made with either the diamond interchange (B1) or the parclo interchange (B2) and would not result in any additional commercial displacements.
- Improvements to Holmes Street are only compatible with the diamond interchanges (B1) and would not result in any additional commercial displacements.

[6] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

[7] Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

North Section

In the North Section of the project (north of the downtown area), the proposed improvements would be completed within existing right-of-way. Therefore, no business relocations would be required.

The number of businesses that would be impacted by the two bridge alignments ranges from 13 to 18; however, the alternatives impacting the most commercial structures do not necessarily result in the largest employee impacts (see Table 4-14, *Displaced Businesses*, for more detail on the impacted businesses). Alignment E would impact the Montgomery Kone (Kone) facility in Moline. Kone, which makes elevators and escalators, is the largest employer directly affected by either alignment alternative. Kone is located immediately to the east of the existing I-74 mainline. It is expected that Kone would relocate their facilities if impacted by the project. Kone currently has several facilities in the Moline area, in addition to the one adjacent to I-74, which also presents opportunities for relocation of employees to other locations currently owned by Kone.

Several relocation options may be available to displaced businesses if they choose to relocate. Realtors indicated that the commercial property market is active with many available properties, and that there would be ample opportunity to relocate businesses that would be impacted by the proposed project (Personal Communication 2002). However, highway-dependent commercial establishments that are displaced (e.g., gas stations) may find it difficult to find a comparable replacement property that offers them similar location and access along the corridor. Vacancies at multi-tenant commercial structures are available throughout the Quad Cities area for displaced businesses currently located in similar buildings. Relocation options for displaced businesses may result from the sale of excess parcels to provide vacant property on which to build. The City of Bettendorf's redevelopment plan may also present new opportunities for business relocation.

While employees are expected to maintain their employment with relocated businesses, those who wish not to relocate with their employer should expect to find alternatives in the Quad City area. The 40-percent increase in employment (number of jobs) between 1970-2000 coupled with a low unemployment rate indicate an availability of employment opportunities if employees of displaced businesses wish to seek new employment opportunities (see Section 3.3.2, *Employment and Income*, for more discussion on employment trends in the Quad Cities).

Indirect and Cumulative Impacts

While all of the build alternatives involve the relocation of some local businesses, the reconstruction of I-74 also has the potential to improve the overall competitive position of the Quad Cities through improved access to the downtown areas. For a discussion of impacts to the tax base, see Section 4.2.5 and 4.2.6, *Sales Tax Revenues* and *Property Taxes*. Businesses that are not displaced by any of the alternatives may still be impacted by changes to the transportation system, including access changes and redevelopment initiatives under the jurisdiction of the cities. Improvements to I-74 would improve mobility through the Quad Cities and could improve its ability to attract and maintain businesses that depend on the effective movement of goods and services.

TABLE 4-14
Displaced Businesses

Alternative	Number of Displaced Structures by Business Type	Estimated Number of Employees Associated with the Displaced Businesses
Alignment E with M1 (Moline)	1 Industrial	500
	1 Restaurant	5
	1 Manufacturing	25
	1 Retail	5
Alignment E with M2 (Moline)	1 Industrial	500
	1 Manufacturing	50
	1 Auto Repair	5
	1 Restaurant	5
	1 Funeral Parlor	5
	2 Retail	10
Alignment F with M1 (Moline)	1 Manufacturing	50
	1 Restaurant	5
	1 Retail	10
Alignment F with M2 (Moline)	1 Manufacturing	50
	1 Auto Repair	5
	1 Restaurant	5
	1 Funeral Parlor	5
	2 Retail	10
Alignment E with B1 (Bettendorf)	1 Auto Repair	5
	1 Auto Rental/Sales	5
	1 Hotel	10
	1 Restaurant	15
	4 Gas Stations	20
	2 Service	11
	2 Retail	7
Alignment E with B2 (Bettendorf)	1 Auto Repair	5
	1 Auto Rental/Sales	5
	1 Hotel	10
	1 Restaurant	15
	5 Gas Stations	25
	1 Service	6
	2 Retail	7
Alignment F with B1 (Bettendorf)	1 Auto Repair	5
	1 Auto Rental/Sales	5
	1 Hotel	10
	1 Restaurant	15
	4 Gas Stations	20
	1 Service	6
	2 Retail	7
Alignment F with B2 (Bettendorf)	1 Auto Repair	5
	1 Auto Rental/Sales	5
	1 Hotel	10
	1 Restaurant	15
	4 Gas Stations	20
	1 Service	6
	2 Retail	7

Access changes associated with the proposed improvements could result in both beneficial and adverse effects on some of the businesses adjacent to and near the existing I-74 corridor. Certain types of businesses are more sensitive to roadway location than others. Retail businesses and other business that are dependent on accessibility and high visibility are more directly affected by their physical proximity and access to a roadway. Some retail businesses are located near interchanges in order to serve travelers. If the I-74 river crossing is relocated, and access points in the downtown areas change, the competitive position of some establishments could be diminished while others would be enhanced by the change in location. The proposed alignments and interchange locations have been designed to minimize impacts to businesses and provide optimal accessibility to businesses that could benefit from interstate traffic.

While business displacements and relocations would be a direct result of the proposed improvements, in the long run, the modifications of the corridor would result in improved mobility throughout the region, and enhanced links to other interstates as well as various alternative modes of travel. Transportation is one key factor that attracts businesses to a location. Almost 40 million people are located within 300 miles of the Quad Cities. The *2000 Comprehensive Economic Development Strategy* highlighted two challenges that were viewed as hindering economic development in the Quad Cities:

- Inadequate existing infrastructure in many parts of the region to support either new business or business expansion.
- A need for additional bridge capacity due to the large number of employees who commute across the river.

Both of these issues would be addressed with the implementation of the I-74 improvements. With the improvements in place, the continued commitment of the local communities, and regional planning organization, the I-74 improvements and the ongoing local efforts could help the region reach its economic development goals. The actual long-range effects of the I-74 improvements would be greatly dependent on the goals and desires of the communities. Regulatory controls such as tax incentives, land use plans, and zoning regulations exist to control the overall effects of the I-74 improvements. Improvements to I-74 would improve mobility throughout the Quad Cities and improve its ability to attract and maintain businesses that depend on the effective movement of goods and services.

4.2.4 Property Values

When existing roads are expanded or new roads are constructed, the market value of adjacent properties may be affected. Generally, fronting residential properties suffer decline in value due to an increase in traffic, noise, and air pollution. Businesses may increase in value due to improved access for customers and delivery vehicles. It is difficult to speculate on these impacts, since properties must be sold to determine market value and then a comparison made to recent sales prices for similar properties.

However, since the properties that would be affected by the proposed action are already located near or immediately adjacent to an interstate, the alternatives would have negligible impacts on the overall values of properties in the area. Access changes associated with the proposed improvements could result in beneficial or adverse effects on individual properties, particularly for those establishments dependent on accessibility and high visibility are more directly affected

by their physical proximity and access to a roadway. Those effects, however, would be limited to a few parcels, and the project would have no overall effect on property values in the area.

Indirect and Cumulative Impacts

An improved interstate facility can be expected to have a positive effect on property values over the long term, with improved access stimulating business development. While property values of individual parcels may decline, the cumulative impact of property value changes is anticipated to be positive for the communities and for the region.

4.2.5 Sales Tax Revenues

Depending on the alternative selected, the project would lead to the displacement of as many as 30 businesses. These businesses include restaurants, manufacturing facilities, and service industries. Based on the availability of commercially zoned properties within the project area, it is expected that these businesses would relocate within or near the project area. The loss of sales tax revenues generated from these businesses would be insignificant due to this expected relocation, which would redistribute sales in the area and therefore would not decrease sales tax revenues.

Overall, the tax base impacts associated with the project would be small in relation to total tax revenue for the Quad Cities. Therefore, the project would not have a significant impact on the tax base.

4.2.6 Property Taxes

A short-term tax revenue loss in the region would result from the conversion taxable land into a nontaxable transportation use under the build alternatives. To evaluate the tax losses, information was obtained from the County Tax Assessors' and Treasurers' offices for Scott and Rock Island counties. Values of the taxable properties to be acquired for right-of-way were estimated and separated into commercial and residential when possible due to different tax rates. This assessment included the value of land and improvements to the land (i.e., structures on the property).

The City of Bettendorf collects annual property taxes of $150,658,644. Properties in downtown Bettendorf are taxed at a rate of $33.13840 per $1,000 value on 97.7701 percent of commercial and 51.6676 percent of residential properties.

The City of Moline collects annual property taxes of $146,122,784.67. Properties are taxed at $8.7195 per $100 value on the market value (three times the assessed value) for both commercial and residential properties.

No-Action Alternative

The No-Action Alternative does not require such conversion, and therefore does not result in any short-term tax revenue loss for either Bettendorf or Moline.

South Section

In the South Section, the improvements would be constructed within the existing right-of-way and would not result in any impacts on the tax revenue of Rock Island County.

Central Section—Mainline/Interchange Improvements

Property and the associated tax impacts on the Illinois side of the river are concentrated in downtown Moline. Impacts to the Rock Island County tax rolls would vary from approximately 330,000 to 780,000, or 0.2 percent to 0.5 percent of the total annual property tax. The largest impacts would be associated with the Alignment E river crossing. Alignment E coupled with the split diamond interchange configuration (M1) would result in a property tax impact of approximately $700,000, whereas Alignment E with the loop interchange configuration (M2) would result in an impact of approximately $780,000.

Tax impacts associated with the Alignment F river crossing would be considerably lower than Alignment E. Alignment F coupled with the split diamond interchange configuration (M1) would result in a tax loss of approximately $330,000, whereas Alignment F with a loop interchange configuration (M2) would result in a tax loss of approximately $400,000.

Most of the property tax impacts in Bettendorf would occur in the downtown area. Tax loss in this area ranges from approximately $70,000 to $112,000, or 0.05 percent to 0.07 percent of the total annual property tax collected in the county. Alignment E with the parclo interchange configuration (B2) would result in a loss of approximately $70,000, while Alignment E coupled with the diamond interchange (B1) would result in a higher tax loss of approximately $95,000. Alignment F with the parclo interchange configuration (B2) would result in a loss of approximately $92,000, whereas the diamond interchange configuration (B1) would result in a loss of $112,000 of property taxed.

Tax revenue in the river crossing section is summarized in Table 4-15, *Estimated Tax Loss Summary in the Downtown/River Crossing Section*.

TABLE 4-15
Estimated Tax Loss Summary in the Downtown/River Crossing Section

	Moline				Bettendorf			
	M1 ($)	Percent of Total Annual Tax	M2 ($)	Percent of Total Annual Tax	B1 ($)	Percent of Total Annual Tax	B2 ($)	Percent of Total Annual Tax
Alignment E	700,000	.48	780,000	.53	95,000	.05	70,000	.06
Alignment F	330,000	.22	400,000	.26	112,000	.06	92,000	.07

Central Section—Local Roadway Improvements

The tax revenue loss associated with local roadway improvements is discussed below.

U.S. 67 Improvements.

- For improvements to U.S. 67 with a connection off of a diamond interchange (B1) in a 90-degree configuration, the total annual property tax losses are estimated to be approximately $16,000, or 0.01 percent of the total annual taxes collected.
- For improvements to U.S. 67 with a connection off of a diamond interchange (B1) in a diagonal configuration, the total annual property tax losses are estimated to be approximately $35,000, or 0.02 percent of the total annual taxes collected.

- For improvements to U.S. 67 with a connection off of a parclo interchange (B2)[8] in a 90-degree configuration, the total annual property tax losses are estimated to be approximately $7,000, or 0.005 percent of the total annual taxes collected.
- For improvements to U.S. 67 with a connection off of a parclo interchange (B2)[9] in a diagonal configuration, the total annual property tax losses are estimated to be approximately $28,000, or 0.02 percent of the total annual taxes collected.

TABLE 4-16
Estimated Tax Loss Summary at U.S. 67 Per Mainline/Interchange Improvement

	Moline			
	B1 ($)	**Percent of Total Annual Tax**	**B2*** ($)	**Percent of Total Annual Tax**
90-Degree	16,000	.01	7,000	.005
Diagonal	35,000	.02	28,000	.02

* Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

Kimberly Road/Holmes Street Improvements.

- Improvements to Kimberly Road can be made with either the diamond interchange (B1) or the parclo interchange (B2) and would not result in any additional business displacements.
- Improvements to Holmes Street is only compatible with the diamond interchanges (B1); the total annual property tax losses are estimated to be $1,200, or 0.00075 percent of the total annual taxes collected.

North Section

In the North Section, the improvements would be constructed within the existing right-of-way and would not result in any impacts on the tax revenue of Scott County.

Indirect and Cumulative Impacts

While a direct loss in property tax revenue would be a result of the proposed improvements, in the long run, the modifications of the corridor would result in improved mobility throughout the region, and enhanced links to other interstates as well as various alternative modes of travel. As discussed earlier in this document, transportation is one key factor that attracts businesses to a location. This improvement coupled with other efforts planned in the area could result in redevelopment in the area. Such development would ultimately result in an increase in property taxes, more than off-setting the losses associated with the initial construction.

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8 Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

9 Impacts shown for Interchange Variation B2 reflect 2 lanes in each direction along Grant Street. Providing 3 lanes in each direction would have impacts similar to Interchange Variation B1.

4.3 Air Quality

4.3.1 Conformity

No portion of this project is within a designated nonattainment area for any of the air pollutants for which the USEPA has established standards. Accordingly, a conformity determination under 40 CFR Part 93 ("Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 USC or the Federal Transit Act") is not required.

4.3.2 Microscale Analysis

The project was assessed for localized, or site specific, air quality impacts at intersections. The 23rd Avenue interchange was selected as the location to be evaluated due to traffic volumes and close proximity of residential receptors. The air quality effects of the proposed project were analyzed using the Illinois Carbon Monoxide Screen for Intersection Modeling (COSIM). The "worst case" analysis provided by the COSIM model indicated that the proposed undertaking does not have the potential for contributing to a violation of the National Ambient Air Quality Standard for carbon monoxide. Carbon monoxide concentrations for the worst-case receptor were as follows:

No-Action Alternative

The No-Action alternative was also evaluated, with the following results:

- Build – Time of Completion (TOC) (2008): 6.2 parts per million (ppm)
- TOC + 10 years (2018): 6.6 ppm
- Design Year (2025) : 7.1 ppm

Build Alternatives

- Existing (2000): 6.8 ppm
- Build – TOC (2008): 5.9 ppm
- TOC + 10 years (2018): 6.4 ppm
- Design Year (2025): 6.7 ppm

The results from this roadway improvement indicate that the concentrations are below the 8-hour National Ambient Air Quality Standard of 9.0 ppm, which is necessary to protect public health and welfare. However, as indicated by the results, if capacity was not increased, air quality would be affected by the escalation of pollutant emissions from vehicles idling as a result of traffic congestion.

4.4 Noise Impacts

4.4.1 Definition of Noise Impact

Traffic noise levels were calculated using the FHWA Traffic Noise Model (TNM) Version 2.0. It was used to calculate traffic-generated noise levels in terms of L_{eq} (h), the hourly energy equivalent sound level, which is based on an "A-weighted" decibel unit (dBA).

Noise is composed of different frequencies, each of which is perceived differently by the human ear. Human hearing is not sensitive to low and very high frequencies. To compensate for low and high-end frequency insensitivity and thereby render noise level readings more meaningful, an A-weighted scale is used to approximate the response of the human ear. The dBA unit measures perceptible sound energy and factors out the extreme high and low frequencies.

L_{eq} is defined as the equivalent steady-state sound level which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same period. L_{eq} (h) is the hourly value of L_{eq}.

According to 23 CFR 772, traffic noise impacts occur when the predicted traffic noise levels approach or exceed the FHWA Noise Abatement Criteria (NAC), or when the predicted noise levels substantially exceed the existing noise levels (Table 4-17, *Noise Abatement Criteria Hourly A-Weighted Sound Level in Decibels*). Both the Iowa and Illinois DOTs define "approaching" as being within 1 decibel of NAC; the Iowa DOT defines "substantial" as reaching 10 decibels over NAC, whereas the Illinois DOT defines "substantial" as reaching 14 decibels over NAC. The analysis of receiver sites over existing noise levels indicates no substantial increases in future noise levels over existing noise levels.

TABLE 4-17
Noise Abatement Criteria (NAC) Hourly A-Weighted Sound Level in Decibels (dBA)*

Activity Category	L_{eq} (h)	L_{10} (h)	Description of Activity Category
A	57 (Exterior)	60 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if they are to continue to serve their intended purpose.
B	67 (Exterior)	70 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	75 (Exterior)	Developed lands, properties or activities not included in Categories A and B above.
D	—	—	Undeveloped lands.
E	52 (Interior)	55 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

* Either L_{eq} (h) or L_{10} (h) (but not both) may be used on a project.

Source: Code of Federal Regulations. Title 23 CFR Part 772–Procedures for Abatement of Highway Traffic Noise and Construction Noise Federal Highway Administration, April 1992.

4.4.2 Traffic-Generated Noise Levels

Noise impacts were calculated by applying the FHWA TNM Version 2.0 computer program to receiver locations at noise sensitive sites throughout the corridor. See Table 4-18, *I-74 Predicted Existing and Future Noise Levels – Peak-Hour Traffic Volume*, for a description of the receiver locations. TNM was developed to predict hourly L_{eq} values for free flowing and interrupted-flow traffic conditions, and is generally considered to be accurate within ±3 dBA.

Traffic noise levels were measured at specific locations and time and then calibrated according to the model and then future noise levels were predicted. Calibrated measurements improve the accuracy of the data. The accuracy of predicted measurements is also improved. To predict a conservative assessment of future traffic impacts, noise-attenuating effects of buildings, trees and foliage were not modeled. Table 4-18, *I-74 Predicted Existing and Future Noise Levels – Peak-Hour Traffic Volume*, contains future traffic noise levels as modeled by TNM.

No-Action Alternative

For the No-Action Alternative, noise levels would range from 63 to 77 dBA. Some sensitive noise receivers would experience no change or a decrease in noise levels. These changes would be barely perceptible to the human ear.

South Section

In the South Section, out of 18 noise receivers, one would experience noise levels that would approach NAC, 15 would experience noise levels that exceed the NAC, and two would not be impacted by the build alternatives. For the No-Action Alternative, two noise receivers would experience noise levels approaching the NAC, 13 would experience noise levels exceeding the NAC, and three would experience no impact.

Central Section

Due to the differences in ramp configurations and shifts in their alignments in the downtown areas of Bettendorf and Moline, variations M1, M2, B1, and B2 would cause varying effects upon future noise levels, with noise levels at individual receivers increasing for some alternatives and decreasing for others. Increases of 1 to 2 dBA would be expected at various sensitive receivers depending on the alternative. A reduction of 1 to 5 dBA occurs at a limited number of receivers. A decrease of 3 dBA would be perceived as a barely perceptible reduction, while an increase in 2 dBA would be perceived as a barely perceptible increase. Predicted future noise impacts have been identified at worst-case conditions, which would typically occur during weekday rush hours. During all other times, noise levels would be lower by varying amounts. Table 4-19, *Number of Impacted Noise Receivers per Interchange Variation*, indicates the number of noise receivers impacted by the interchange variations in the Central Section.

TABLE 4-18A
South Section: I-74 Predicted Existing and Future Noise Levels—Peak-Hour Traffic Volume

Nearest Interchange	ID	Receiver Description	Average Distance to Existing I-74 Mainline* (ft)	FHWA/State Criterion	Noise Levels - Leq (dBA)			Impact by Approaching or Exceeding NAC or Substantially Exceeding Existing Noise Levels?		Noise Abatement	
					Existing	No Build	Proposed	No Build	Proposed	With Abatement (dBA)	Average Noise Reduction (dBA)
12th Ave.	SF31	Residence 1820 12th Ave.	230	67	68	69	69	Exceed	Exceed	61	8
	SF32	Residence 1873 19th St.	90	67	72	72	70	Exceed	Exceed	63	7
23rd Ave.	R13	Receiver 13	60	67	76	77	78	Exceed	Exceed	67	11
	R14	Receiver 14	80	67	76	76	78	Exceed	Exceed	64	14
	R15	Receiver 15	340	67	68	69	69	Exceed	Exceed	64	5
	R16	Receiver 16	310	67	67	68	67	Exceed	Exceed	59	8
	SF33	Residence 1719 18th St.	260	67	69	69	72	Exceed	Exceed	64	8
	MF3	Loganwood Apartments	570	67	65	66	66	Approach	Approach	62	4
	SF34	2302 18th Ave. A	620	67	62	63	64	No Impact	No Impact	60	4
	SF35	1912 23rd St.	480	67	65	66	67	Approach	Exceed	62	5
	SF36	2003 18th St.	220	67	70	71	71	Exceed	Exceed	64	7
	SF37	1946 23rd St.	330	67	70	71	71	Exceed	Exceed	67	4
	SF38	1585 22nd Ave.	380	67	67	68	68	Exceed	Exceed	63	5
	SF39	1890 22nd Ave.	330	67	69	70	69	Exceed	Exceed	63	6
	SF40	2315 23rd St.	460	67	65	65	67	No Impact	Exceed	62	5
	SF41	1881 23rd Ave.	420	67	64	65	65	No Impact	No Impact	63	2
	CH3	New Fellowship Church	340	67	67	68	69	Exceed	Exceed	62	7
	SF42	2425 19th St.	240	67	69	70	71	Exceed	Exceed	62	9

R = Receiver locations monitored during onsite measurements
SF = Single-Family Residence
P = Park
MF = Multifamily Residence
CH = Church
H = Hotel, Motel, or Inn
Receiver Relocated = Due to proposed shifts in alignment, the receiver will be displaced from current location
Average distance from the receiver to the edge of the nearest lane
- Noise abatement was not considered

TABLE 4-18B
Central Section – Moline: I-74 Predicted Existing and Future Noise Levels—Peak-Hour Traffic Volume

Nearest Interchange / Crossroad	ID	Receiver Description	Average Distance to Existing I-74 Mainline* (ft)	FHWA/State Criterion	Noise Levels - Leq (dBA)				Impact by Approaching or Exceeding NAC or Substantially Exceeding Existing Noise Levels?		Noise Abatement	
					Existing	No Build	M1	M2	No Build	M1/M2	With Abatement (dBA)	Average Noise Reduction (dBA)
River Dr. & 7th Ave.	R12	Receiver 12	70	67	76	77	75	75	Exceed	Exceed	64	12
Downtown Moline	R17	Receiver 17	220	67	74	74	75	75	Exceed	Exceed	-	-
	R20	Receiver 20	490	67	65	65	66	66	No Impact	Approach	-	-
	R21	Receiver 21	230	67	66	66	68	Receiver Relocated	Approach	Exceed/NA	-	-
	MF2	Apartment Complex - 2028 7th Ave.	250	67	67	67	67	67	Exceed	Exceed	62	6
	SF23	Residence 719 22nd St.	630	67	63	64	64	64	No Impact	No Impact	-	-
	SF24	Residence 721 21st St.	460	67	65	65	66	66	No Impact	Approach	-	-
	H8	Hampton Inn	320	67	67	68	67	67	Exceed	Exceed	-	-
	SF25	Residence 1933 11th Ave.	310	67	71	71	72	72	Exceed	Exceed	-	-
	SF26	Residence 1746 18th St.	290	67	72	72	73	73	Exceed	Exceed	-	-
	H9	Super 8 Motel	90	67	70	71	68	68	Exceed	Exceed	64	6
	SF27	Residence 1822 11th Ave.	110	67	76	76	75	75	Exceed	Exceed	68	8
	SF28	Residence 1114 18th St.	330	67	67	68	69	69	Exceed	Exceed	64	5
	SF29	Residence 1817 12th Ave.	200	67	70	71	72	72	Exceed	Exceed	65	7
12th Ave.	SF30	Residence 1874 12th Ave.	210	67	67	67	65	66	Exceed	No Impact/Approach	62	4

R = Receiver locations monitored during onsite measurements
SF = Single-Family Residence
P = Park
MF = Multifamily Residence
CH = Church
H = Hotel, Motel, or Inn
Receiver Relocated = Due to proposed shifts in alignment, the receiver will be displaced from current location
Average distance from the receiver to the edge of the nearest lane
- Noise abatement was not considered

TABLE 4-18C
Central Section – Bettendorf: I-74 Predicted Existing and Future Noise Levels—Peak-Hour Traffic Volume

Nearest Interchange / Crossroad	ID	Receiver Description	Average Distance to Existing I-74 Mainline* (ft)	FHWA/ State Criterion	Noise Levels - Leq (dBA)				Impact by Approaching or Exceeding NAC or Substantially Exceeding Existing Noise Levels?		Noise Abatement	
					Existing	No Build	B1	B2	No Build	B1/B2	With Abatement (dBA)	Average Noise Reduction (dBA)
Lincoln Road	CH1	Kingdom Hall	170	67	70	71	72	72	Exceed	Exceed	-	-
U.S. 67 (Grant St.)	R10	Receiver 10	120	67	73	73	73	73	Exceed	Exceed	61	13
Downtown Bettendorf	R18	Receiver 18	420	67	65	66	64	63	Approach	No Impact	-	-
	R19	Receiver 19	400	67	69	70	69	69	Exceed	Exceed	-	-
	SF12	Residence 1152 Highland Park Dr.	420	67	66	67	66	66	Exceed	Approach	60	7
	SF13	Residence 1311 Highland Park Dr.	130	67	73	74	75	75	Exceed	Exceed	66	9
	SF14	Residence	370	67	67	67	68	68	Exceed	Exceed	63	5
	SF15	Residence 1212 Highland Ct.	220	67	72	73	73	73	Exceed	Exceed	66	7
	SF16	1023 Highland Park Dr.	330	67	69	69	70	70	Exceed	Exceed	70	1
	SF17	Residence 1136 Hall	400	67	66	66	65	65	Approach	No Impact	-	-
	SF18	Residence 1140 Jones	490	67	65	65	63	63	No Impact	No Impact	-	-
	SF19	Residence 610 Mississippi	560	67	64	64	63	63	No Impact	No Impact	-	-
	SF20	Residence 1303 Mississippi	150	67	68	69	68	Receiver Relocated	Exceed	Exceed/NA	-	-
	SF21	Residence 1203 Mississippi	490	67	65	65	65	64	No Impact	No Impact	-	-
	H7	Travel Hotel	270	67	71	72	Receiver Relocated	Receiver Relocated	Exceed	NA	-	-
	CH2	Apostolic Assembly of Bettendorf	580	67	68	68	67	67	Exceed	Exceed	-	-
	SF22	Residence 1140 Grant	700	67	63	64	63	62	No Impact	No Impact	-	-
	P1	Park – Downtown Bettendorf	170	67	67	68	66	62	Exceed	Approach/No Impact	-	-

R = Receiver locations monitored during onsite measurements
SF = Single-Family Residence
P = Park
MF = Multifamily Residence
CH = Church
H = Hotel, Motel, or Inn
Receiver Relocated = Due to proposed shifts in alignment, the receiver will be displaced from current location
Average distance from the receiver to the edge of the nearest lane
- Noise abatement was not considered

TABLE 4-18D
North Section—I-74 Predicted Existing and Future Noise Levels—Peak-Hour Traffic Volume

Nearest Interchange	ID	Receiver Description	Average Distance to Existing I-74 Mainline* (ft)	FHWA/State Criterion	Noise Levels - Leq (dBA)			Impact by Approaching or Exceeding NAC or Substantially Exceeding Existing Noise Levels?		Noise Abatement	
					Existing	No Build	Proposed	No Build	Proposed	With Abatement (dBA)	Average Noise Reduction (dBA)
53rd Street	R1	Receiver 1	180	67	66	67	67	Exceed	Exceed	62	5
	SF1	Residence 3613 E 62nd	190	67	66	67	68	Exceed	Exceed	61	8
	SF2	Residence 2nd row	390	67	60	62	62	No Impact	No Impact	56	5
	SF3	Northern-most property	560	67	57	58	58	No Impact	No Impact	56	2
	SF4	Southern-most property	310	67	61	62	62	No Impact	No Impact	60	2
U.S. 6/	R2	Receiver 2	120	67	69	70	71	Exceed	Exceed	-	-
Spruce Hills Drive	R3	Receiver 3	80	67	72	72	73	Exceed	Exceed	62	11
	R4	Receiver 4	120	67	72	72	72	Exceed	Exceed	61	11
	R5	Receiver 5	90	67	73	73	74	Exceed	Exceed	-	-
	SF5	Residence 730 Tanglefoot	210	67	69	70	71	Exceed	Exceed	-	-
	H1	Heartland Inn	310	67	68	69	69	Exceed	Exceed	-	-
	H2	Courtyard by Marriott	260	67	66	67	67	Exceed	Exceed	-	-
	H3	Summer's Inn	770	67	63	65	65	No Impact	No Impact	-	-
	H4	Fairfield Marriott Inn	870	67	60	60	60	No Impact	No Impact	-	-
	H5	Signature Inn	590	67	64	65	65	No Impact	No Impact	-	-
	MF1	Williamsburg Colony Apartments	300	67	68	69	69	Exceed	Exceed	60	9
	SF6	Residence 2708 Hawthorne Dr.	190	67	69	70	70	Exceed	Exceed	62	8
	SF7	Residence 2613 Hawthorne Dr.	250	67	68	69	68	Exceed	Exceed	60	8
	SF8	Residence 2339 Hawthorne Dr.	160	67	68	69	66	Exceed	Approach	57	9
Middle Road	R6	Receiver 6	430	67	63	63	63	No Impact	No Impact	-	-
	R7	Receiver 7	300	67	68	68	68	Exceed	Exceed	-	-
	R8	Receiver 8	110	67	72	73	74	Exceed	Exceed	62	12
	R9	Receiver 9	100	67	73	73	74	Exceed	Exceed	65	9
	R11	Receiver 11	150	67	73	73	75	Exceed	Exceed	-	-
	SF9	Residence	300	67	66	66	65	Approach	No Impact	-	-
	SF10	Residence 1128 Middlebrook	230	67	70	70	70	Exceed	Exceed	58	12
	SF11	Residence	400	67	66	66	67	Approach	Exceed	62	5
	H6	Holiday Inn	360	67	70	71	72	Exceed	Exceed	-	-

R = Receiver locations monitored during onsite measurements
SF = Single-Family Residence
P = Park
MF = Multifamily Residence
CH = Church
H = Hotel, Motel, or Inn
Receiver Relocated = Due to proposed shifts in alignment, the receiver will be displaced from current location
Average distance from the receiver to the edge of the nearest lane
- Noise abatement was not considered

North Section

Impacts to noise receivers under the build scenario are as follows: one receiver would experience noise levels approaching the NAC, 19 would experience noise levels exceeding the NAC, and eight would experience no impact. For the No-Action Alternative, two noise receivers would experience noise levels approaching the NAC, 19 would experience noise levels exceeding the NAC, and seven would experience no impact.

TABLE 4-19
Number of Impacted Noise Receivers per Interchange Variation

Impact	Downtown Moline			Downtown Bettendorf		
	No-Action	M1	M2	No-Action	B1	B2
Approach NAC	1	2	3	2	2	1
Exceed NAC	11	11	10	11	9	8
No Impact	3	2	1	4	6	7
Receiver Relocated	0	0	1	0	1	2

4.4.3 Traffic Noise Abatement Strategies

Future traffic noise impacts experienced at numerous noise sensitive areas along the I-74 project area would approach or exceed the federal and state noise abatement criteria of 67 dBA and would require noise abatement consideration (Table 4-18, *I-74 Predicted Existing and Future Noise Levels – Peak-Hour Traffic Volume*). Potential traffic noise abatement strategies typically considered for mitigating roadway noise include the following:

- Constructing noise barriers
- Realigning the roadway
- Modifying vehicle speed limits
- Restricting truck traffic
- Relocating the receiver

Of the above potential noise abatement measures, the noise barrier option is usually the most practical, reasonable, and effective choice. Two common noise barrier options to control exposure from traffic noise impacts are vertical noise barriers and earthen berms. For this analysis, vertical noise barriers are preferred since earthen berms may require substantial right-of-way acquisition. All barriers were analyzed within highway right-of-boundaries (see Figure 4-1, *Studied Noise Barriers and Receiver Locations*, at the end of Section 4).

4.4.4 Noise Barrier Analysis

Noise barriers were analyzed in both the Iowa and Illinois sections of the I-74 project corridor. Table 4-20, *I-74 Noise Barrier Calculations*, provides a summary of the noise barrier analysis. Since the alignments do not differ where noise barriers are needed, the proposed barriers apply to all alternatives. In the downtown areas, where the alignment shifts and interchange modifications were significant, noise barriers were not warranted since land use is primarily commercial and light industrial.

TABLE 4-20
I-74 Noise Barrier Calculations

Barrier ID	State	Barrier Location	Number of Benefited Residences	Noise Reduction Range per Benefited Residence (dBA)	Barrier Height Range/Average Barrier Height (ft)	Barrier Length (ft)	Barrier Area (ft^2)	Barrier Cost ($)	Cost per Benefited Residence[a] ($)	Criteria Met ? Yes[b] or No
Barrier 1	Iowa	NE of 53rd St. interchange adjacent to residential area	20	5 - 8	12/12	2405	28865	577,300	*28,900*	No
Barrier 2	Iowa	SE of US Route 6/Spruce Hills Drive interchange adjacent to residential area	54	5 - 11	10 to 14/13	3390	43093	861,900	16,000	Yes
Barrier 3	Iowa	SE of Middle Rd. interchange extending to Lincoln Rd and adjacent to residential area	22	5 - 12	12 to 16/13	1755	22441	448,800	20,400	Yes
Barrier 4	Iowa	SW of Lincoln Rd. adjacent to residential area	8	5 - 12	10 to 14/12	1140	13406	268,100	*33,500*	No
Barrier 5	Iowa	SE of Lincoln Rd. adjacent to residential area	10	5 - 10	12 to 20/15	957	14306	286,100	*28,600*	No
Barrier 6	Illinois	NW of 12th Ave. extending to 23rd Ave interchange adjacent to residential areas	59	5 - 14	10 to 16/13	4363	56327	1,408,200	23,900	Yes
Barrier 7	Illinois	NE of 12th Ave. extending to 23rd Ave. interchange and adjacent to a hotel & residential area	20	5 - 8	10 to 16/14	4216	55501	1,387,600	*69,400*	No
Barrier 8	Illinois	SW of 23rd Ave. interchange adjacent to residential area	18	6 - 8	12 to 14/12	1729	21381	534,500	*29,700*	No
Barrier 9	Illinois	SE of 23 Ave. interchange adjacent to residential area	6	5 - 8	10 to 14/12	2128	25015	625,400	*104,200*	No

[a] Barrier costs per residence in italics exceed cost reasonability limits.

[b] Final construction of any noise abatement will depend on public input and final design considerations.

TNM model 2.0 was used to assess the effectiveness of noise barriers along I-74. The program calculates barrier insertion loss by accounting for variables, such as distance from source to barrier, distance from barrier to receiver, source and receiver elevations, and barrier height. Additional representative receivers were inserted into the model to further improve precision in calculating the number of dwelling units benefited from a noise barrier. Per standard assumptions, effective acoustical heights of automobiles, medium trucks, and heavy trucks are at roadway surface, 2 and 8 feet above the road, respectively. The receiver height is assumed to be about 5 feet above the ground. Potential noise barriers locations are shown in Figure 4-1, *Studied Noise Barriers and Receiver Locations,* at the end of Section 4 and Appendix B, *Aerial Photo Exhibit*s.

Iowa Noise Barriers

Potential noise barrier locations in Iowa were only considered for residential areas with multiple dwellings. Hotels, churches, and schools are not generally included in noise abatement analyses since frequent human activity in these facilities usually occurs indoors, and hotels and churches normally desire visual exposure from the highway. Furthermore, noise barriers would generally not be constructed for individual residences, as described in Iowa's policies for traffic noise analysis and abatement. As a result, an analysis was performed at five residential locations to determine the physical feasibility and economical reasonability of implementing noise barriers. Iowa has developed a $24,000 cost reasonability criteria per benefited residence. Two barriers would meet this criteria.

Barrier 1. A barrier was analyzed northeast of the 53rd Street interchange adjacent to a residential community. The barrier would run from just north of the residential community near agricultural lands and extend past the southern edge of the development. The noise barrier would be approximately 2,400 feet long and 12 feet tall. A 5- to 8-dBA reduction would be realized at ten first row residences and a total of 20 residences would achieve a 5-dBA reduction. The cost of the noise barrier would be $577,300, resulting in a cost per benefited residence of $28,900. The barrier would achieve the Iowa DOT's feasibility standard of an 8-dBA reduction at a receiver; however, it would not meet the $24,000 cost reasonability criteria per benefited residence.

Barrier 2. In a residential area southeast of the U.S. 6/Spruce Hills Drive interchange, a proposed noise barrier was evaluated for single- and multi-family residences. The barrier would be 3,390 feet long and 10 to 14 feet tall. The barrier would provide noise attenuation of 7 to 11 dBA to 24 first row residences and would benefit an additional 30 residences, reducing the predicted noise levels at least 5 dBA. The expected barrier costs would be approximately $861,900, and the cost per benefited residence would be $16,000. This barrier would satisfy the Iowa DOT's feasibility and reasonability criteria. Final construction of any noise abatement will depend on public input and final design considerations.

Barrier 3. A noise barrier was assessed for the residential community southeast of the Middle Road interchange extending to Lincoln Road. The barrier would shield approximately 22 residences, reducing noise levels 5 to 12 dBA; first row residences would achieve a reduction of 8 to 12 dBA. The barrier would be approximately 1,760 feet long, range from 12 to 16 feet tall, and cost $448,800. The cost per benefited residence would be $20,400. This barrier would meet the Iowa DOT's feasibility and reasonability criteria. Final construction of any noise abatement will depend on public input and final design considerations.

Barrier 4. Barrier 4 would be located adjacent to a small residential community southwest of Lincoln Road. The barrier would be 1,140 feet long and 10 to 14 feet tall, attenuating noise levels by five to 12 dBA and benefiting eight residences. A residence located south of the southernmost benefited residence resides on the edge of a hill and would not achieve the required 5-dBA reduction since a practical barrier height would not block the line of sight to the highway. The noise barrier would cost approximately $268,100, resulting in a cost per benefited residence of $33,500. Although this noise barrier is feasible, the barrier would not meet the Iowa DOT's reasonability criteria.

Barrier 5. Southeast of Lincoln Road, a barrier was analyzed for a small residential area. The noise barrier would reduce noise levels 7 to 10 dBA at four first row residences. Six additional residences further set back would benefit from a 5 or 6 dBA reduction. The barrier would be approximately 960 feet long and would run from 10 feet at the northern point and reach 20 feet tall at the southern end due to a slope in a hill. The barrier cost would be $286,100 with a cost per benefited residence at $28,600. This barrier would be feasible, but not reasonable per Iowa DOT criteria.

Illinois Noise Barriers

Noise barriers were analyzed for feasibility and reasonability based on the Illinois DOT's procedure memorandum. Construction costs associated with noise barriers would vary depending on material selection; however, for this noise abatement analysis, the Illinois DOT's cost reasonability criterion of $24,000 was employed for all noise barriers. The I-74 mainline connects Iowa to Illinois at the Mississippi River crossing in downtown Moline. From north to south, the corridor traverses through commercial and light industrial areas and then extends south to residential communities, hotels, and churches where noise barriers were evaluated. One barrier meets this criteria.

Barrier 6. Northwest of 12th Avenue, a noise barrier was analyzed for residential areas consisting of single- and multi-family residences. The barrier would reduce noise levels at approximately 59 residences ranging from 5 to 14 dBA, and 28 first row residences would experience a 7- to 13-dBA decrease in noise levels. The barrier would be 4,400 feet long and 10 to 16 feet tall. The barrier would cost $1,408,200, resulting in a cost per benefited residence of $23,900. This noise barrier would meet the Illinois DOT's feasibility requirements and would satisfy cost reasonability criteria. Final locations of any noise abatement will depend on public input and final design considerations.

Barrier 7. A barrier was analyzed on the east side of I-74 traversing from north of the Super 8 Motel to just north of the 23rd Avenue interchange. A gap in the barrier is included to allow for on-ramp access to the I-74 mainline. The barrier would be 4,200 feet long and between 10 to 16 feet tall and would attenuate noise levels by 8 dBA for three front row residences. Another 17 benefited residences would experience noise level reductions of 5 to 7 dBA. The barrier cost would be $1,387,600 and the cost per benefited residence would be $69,000. Although potentially feasible, this noise barrier would not meet the Illinois DOT's reasonability criteria.

Barrier 8. A barrier was evaluated for the residences southwest of the 23rd Avenue interchange. The barrier would run from north of the New Fellowship Church until north of 27th Street. Fourteen first row receivers would realize a noise level reduction of 7 to 8 dBA

and an additional four residences would benefit from the noise barrier. The barrier would be 1,700 feet long and 12 to 14 feet tall. The barrier would cost approximately $535,000, and the cost per benefited residence would be $29,700. This noise barrier would be feasible; however, it would not meet the Illinois DOT's cost reasonability criteria.

Barrier 9. A barrier was analyzed for residences southeast of the 23rd Avenue interchange. The noise barrier would be 2,100 feet long and 10 to 14 feet tall, extending from south of the 23rd Avenue interchange to north of 27th Street. A gap in the barrier is included to allow for off-ramp access from the I-74 mainline to 23rd Avenue. A reduction of 5 to 8 dBA would be achieved at six residences with only one receiver realizing noise attenuation of 8 dBA. The barrier cost would be $625,000, resulting in a cost per benefited residence of $104,000. In general, this barrier would not be feasible or reasonable according to the Illinois DOT's criteria.

In general, noise is not expected to highly impact the quality of life in the communities surrounding the proposed project, especially in sensitive areas such as parks. Where feasible and desired by the public, noise mitigation measures will be put in place. Specifically, three noise barriers meet the criteria and are proposed for placement to minimize expected noise increase: two in Iowa and one in Illinois. Final construction of any noise abatement will depend on public input and final design considerations. Noise related to project construction is discussed in Section 4.19, *Construction and Operational Impacts*.

4.5 Water Quality Impacts

Surface water impacts would result from construction, operation, and maintenance of the proposed build alternatives. Chemical constituents of surface water bodies derive from a variety of inputs, natural or human-induced. Human-induced inputs and associated chemical constituents may include the following:

- **Bridge-deck or road runoff.** Common constituents include particulates, nitrogen, phosphorus, lead, zinc, iron, copper, cadmium, chromium, nickel, manganese, cyanide, sodium, calcium, chloride, and sulfate.
- **Agricultural runoff.** Common constituents include nitrogen, phosphorus, pesticides, and sediments.
- **Industrial or wastewater runoff.** Common wastewater constituents include total suspended solids, phosphorus, nitrogen, and biological oxygen demand.

A summary of water quality impacts within the project area that would result from the alternatives follows.

No-Action Alternative

No additional water quality impacts would result from the No-Action Alternative.

South Section

Proposed road improvements to I-74 in Illinois (away from the Mississippi River) would not cross any water bodies or streams. The existing road incorporates a roadside ditch design and stormwater in these ditches flows directly to the Mississippi River. The proposed road improvements would also direct stormwater to the Mississippi River. Given that the ADT of

this stretch of I-74 would be greater than 30,000, road runoff could adversely affect water quality of road runoff. However, I-74 in the South Section uses a system of vegetated roadside ditches to convey and filter roadway runoff, allowing contaminates adsorbed to sediment particles to be filtered prior to reaching outlet points.

Although there may be private water wells within 200 feet of the right-of-way, this threshold is only relevant for routes and sources of groundwater pollution. Since the project will not introduce any new routes (dry wells or borrow pits) or sources (bulk road oil or deicing salt storage facilities), then there will be no violation of the wellhead setbacks.

Central Section—Mainline/Interchange Improvements

The proposed build alternatives would require demolition of existing bridges and construction and extension of new structures over the Mississippi River. Impacts to water quality would be associated with the construction, operation, and maintenance of these alternatives.

The proposed bridge type over the Mississippi River has not been determined at this point. The bridge type will determine how many piers would be necessary for the proposed structure; a tied arch bridge type would require the greatest number of piers, a cable-stayed bridge type would require the least number of piers, and a suspension type bridge would require an intermediate number of piers. The number of in-stream piers is a factor correlated with water quality; generally more in-stream piers require more substrate disturbance during construction. The in-stream pier footprint of the existing I-74 bridge on the Illinois side is 7,740 square feet. The in-stream pier footprint of the proposed I-74 bridge (on the Illinois side) is not yet known, but it would likely be greater than the existing in-stream bridge pier footprint.

Generally, all of the proposed bridge alternatives would have similar water quality impacts, with the exception that Alignment E would have two piers located on islands, whereas Alignment F would have no piers on islands.

Central Section—Local Roadway Improvements

Local roadway improvements would incorporate a curb and gutter design for stormwater management. Local road stormwater would be diverted ultimately to the Mississippi River. None of the interchanges associated with local roads would incorporate stormwater detention ponds within the interchange ramps.

North Section

Proposed road improvements to I-74 in Iowa (away from the Mississippi River) would cross Duck Creek and three unnamed tributaries to Duck Creek. The existing road incorporates a roadside ditch design and stormwater flows into Duck Creek and its tributaries and ultimately to the Mississippi River. The proposed road improvements would also direct stormwater to the same water bodies. Given that the ADT of this stretch of I-74 would be greater than 30,000, road runoff could adversely affect the water quality of road runoff.

4.5.1 Construction Impacts to Surface Water

Typical operations associated with roadway construction involve clearing, grading, filling, demolition, and excavation all increase the erosion potential of surface soils due to the

reduction in vegetative cover and increased impervious areas resulting from compaction of soil by heavy equipment. Best Management Practices (BMPs), if properly implemented, can serve to minimize potential impacts to water quality as a result of road construction. Proven BMPs per Illinois and Iowa DOT guidance and other sources are summarized in the following sources:

- Iowa DOT's *Construction Manual*
- Illinois DOT's *Joint Design/Construction Procedure Memorandum on Erosion and Sediment Control*

During construction of the new bridge, in-stream pier construction and abutment construction at the river's edge has the potential for erosion and sedimentation. Scour around piers can alter stream bottom characteristics. Implementation of strict erosion control measures and other construction techniques would minimize erosion and sedimentation to the extent practicable. As required in Section 107.01 of the Illinois DOT's *Standard Specifications for Road and Bridge Construction,* contractors constructing the I-74 Mississippi River crossing would observe and comply with all federal and state laws, local ordinances, and regulations that affect the conduct of the work. Construction related erosion impacts would be minimized by:

- Staging construction to minimize the size of exposed areas open at the same time and the length of time each area is exposed.
- Replacing rip-rap along abutments, exposed streambank areas, and around piers.
- Minimizing slope steepness and length; reseeding and mulching slopes every 7 days during construction, as well as at the completion of construction.
- Quickly revegetating stripped areas with approved erosion control seed mix. Seeding of disturbed bank would occur areas every 7 days during construction, as well as at the completion of construction, and other temporary and permanent erosion control devices would be employed.
- Employing temporary erosion control measures such as hay bales, silt fences, etc.
- Using a combination of silt curtains, gunderbooms, and cofferdams where feasible, to minimize the transport of silt within the Mississippi River, downstream from the existing and proposed Mississippi River bridges.

Protective shielding could be used during deck removal to prevent debris from falling to the area beneath the bridge.

The truss span demolition could be accomplished by "floating out" the spans on barges with the deck cut out and removed in sections. This would require barges with scaffolding systems to be floated in so supports could be jacked into place during the dismantling of the trusses.

Girders could be field cut at designated locations for stability during demolition and lifted out individually or as a section.

A temporary trestle could be constructed adjacent to the existing structure. Dismantling and removal of the deck and girders could then be accomplished from the trestle.

Substructures would generally be removed to at least 1 foot below the proposed ground line. Cofferdams, like those used for pier construction, could be used to access the existing piers and to minimize disturbance to the river bottom.

In-stream work may cause an increase in turbidity and sedimentation, and temporarily alter downstream hydraulics and substrate conditions. Cofferdams made of sheet piling combined with silt filtration (e.g., silt curtains or gunderbooms) surrounding in-stream pier work are highly effective techniques to minimize siltation. Any long-term increases in suspended sediments can reduce aquatic productivity by limiting photosynthesis, lowering oxygen levels, and covering food sources and fish spawning areas. In-stream bridge and culvert construction creates localized, permanent changes in habitat. However, habitat is generally impacted only in small areas and these impacts may be relatively minor when the entire stream/river reach is considered.

The Illinois DNR and Illinois DOT classify the Mississippi River a Class I river. With this river classification, the Illinois DOT needs to provide a summary of proposed in-stream work in the Detailed Action Report associated with this Draft EIS in order to begin the work without a construction stipulation. Construction in or near waterways would be performed in accordance with the Iowa DOT's *Construction Manual* and Section 107.01 of Illinois DOT's *Standard Specifications for Road and Bridge Construction.* Construction at stream crossings would be conducted during low or normal flow periods. Erosion control devices would be installed at appropriate times during construction. Coffer dams and silt filtration techniques could be used during demolition of old bridge piers and construction of new piers to minimize the amount of silt and construction-related debris entering the river. Temporary and permanent erosion control methods may include silt fences, retention basins, detention ponds, interceptor ditches, seeding and sodding, rip-rap of exposed embankments, erosion mats, and mulching. The application of these mitigation measures would reduce the effects of turbidity and sedimentation upon Duck Creek and its tributaries and the Mississippi River to minor short-term levels.

Construction impacts to surface waters would be approximately equal with all proposed build alternatives, though the required number of piers varies slightly with proposed bridge type (e.g., tied arch, suspension, or cable-stayed). It should be noted that the Sylvan Slough, a known location of the federally endangered Higgins' eye pearly mussel (*Lampsilis higginsi*), lies partly under the existing I-74 bridge. The Alignment E Mississippi River crossing is closer in proximity to Sylvan Slough than the Alignment F Mississippi River crossing. Thus, the Alignment E Mississippi River crossing may have a greater potential to contribute sediment loading to the Sylvan Slough during bridge construction because sediment would have less time to disperse before being deposited on the river substrate.

Cost-effective soft bridge demolition technologies are available that minimize damage to the aquatic environment and minimize safety risks to the human environment (see the discussion on truss span demolition on the previous page for an example of these types of demolition technologies). Such technologies use non-toxic substances that expand when mixed with water, reducing concrete and rock to rubble in hours to days. Thus, these non-explosive means of bridge demolition minimize silt plumes and eliminate concussive explosions that can damage aquatic life such as mussel beds. Further, non-explosive demolition eliminates the risk of accidental errant demolition projectiles in urban areas.

Minimum horizontal and vertical navigational clearances during construction will be maintained to ensure that there will be no navigational impacts.

4.5.2 Operational and Maintenance Impacts to Surface Waters

Operational and maintenance impacts to the water quality of receiving waters are estimated to be approximately equal among all proposed Build Alternatives. Operational impacts of the roadway improvement on water quality in the receiving waters result from stormwater runoff from highway surfaces, median areas, and adjoining rights-of-way. Maintenance impacts include chemical constituent runoff resulting from application of deicing materials, bridge painting, and other similar activities. The addition of more lanes on the bridges increases the impervious area that, in turn, increases stormwater runoff volumes and can increase in-stream erosion. Additionally, the runoff may carry pollutants that can accumulate as a result of roadway use, natural contributions, deicing materials, herbicide spraying, and deposition of air pollutants. These pollutants could include solids, heavy metals, oil and grease, bacteria, herbicides, and nutrients. With correct application practices, high dilution rates in the Mississippi River, and stormwater management measures in place (where practicable) to intercept the runoff, the impacts of in-stream erosion and pollutants can be reduced.

As described in the FHWA's *Effects of Highway Runoff on Receiving Waters – Volume IV Procedural Guidelines for Environmental Assessments* (Dupuis 1985c), several parameters affect the magnitude of pollution in highway runoff. Parameters are grouped into the following general categories:

- **Traffic characteristics**. Speed, volume, vehicular mix (cars/trucks), congestion factors, state regulations controlling exhaust emissions.
- **Highway design**. Pavement material, percentage impervious area, drainage design.
- **Maintenance activities**. Road cleaning, roadside mowing, herbicide spraying, road sanding/salting, road repair, bridge painting, and paint removal.
- **Accidental spills**. Sand, gravel, oils, chemicals.

The FHWA also described the common highway runoff pollutants and their primary sources. The pollutants most frequently scrutinized for impact assessments are metals (for example, acute and chronic toxicity to aquatic life); particulates (for example, "carriers" of other pollutants and sedimentation effects on aquatic habitat); nutrients (for example, eutrophication); and salts (for example, aquatic life toxicity and drinking water supply taste). Table 4-21, *Common Highway Runoff Pollutants and Their Primary Sources*, includes a list of common highway runoff pollutants and their primary sources.